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# *DEVELOPMENT OF VIDEO BASED MEDIA FOR STUDENTS GRADE XII ON ELEMENTS MATTER*

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## Abstrak

Penelitian ini bertujuan untuk mengetahui kelayakan media berbasis video yang dikembangkan pada materi pokok kimia unsurMedia layak digunakan jika memenuhi kriteria kevalidan, kepraktisan, dan keefektifan. Jenis penelitian ini merupakan penelitian pengembangan *(developmental research).* Prosedur dalam penelitian ini mengacu pada desain R&D oleh Borg and Gall yang dilakukan hanya sebatas pada tahap uji coba awal kepada 12 siswa kelas XI MIA SMAN 1 Puri Mojokerto. Media ini dikatakan layak digunakan sebagai media pembelajaran pada materi kimia unsur. Intrumen penelitian yang digunakan yaitu lembar telaah, lembar validasi, lembar respon siswa, *pretest* dn *posttest.* Kriteria kevalidan diperoleh dari hasil validasi sebesar 94,05% termasuk dalam kategori sangat valid. Kriteria keefektifan ditunjukkan dengan adanya peningkatan hasil belajar siswa, dengan N-gain dalam kategori sedang sebesar 75% siswa dan 25% siswa dalam kategori tinggi. Sedangkan riteria kepraktisan diperoleh dari hasil respon siswa sebesar 93,16% siswa memberikan respon positif sehingga termasuk dalam kategori sangan praktis. Berdasarkan hasil penelitian tersebut, dapat disimpulkan bawah media video demonstrasi kimia layak digunakan sebagi media pembelajaran dalam materi kimia unsur.
**Kata Kunci:** media berbasis video, R&D, demonstrasi kimia, kimia unsur,

## *Abstract*

*This study aims are to determine the feasibility of video based media which developed as instructional media on chemical elements. This type of research is developmental research. The procedures in this study refers to R & D Gall design that carried out only restricted to preliminary field test to 12 students of XI class SMAN 1 Puri Mojokerto. Media is feasible if satisfy at validity, practically, and effectiveness criterions. The instruments used of this study are review sheet, validation sheet, studenst response sheet, pretest and posttest. Validation criteria shown by validation result is 94,05% include in the category very valid.. Efectiveness criteria shown by an increase in learning outcomes of studentsis, with N-gain in the moderate category is 75 % and 25 % is in the high category. While Practically criteria shown by student's response result is 93,16% students which are positive response and included in the category very prctical. Based on these result, it can be concluded that media video demonstration of chemistry which developed is feasible to be used as instructional media on chemical elements.*
***Keywords:*** *video based media, R&D, demonstration of chemistry, chemical elements.*

## INTRODUCTION

The development of science technology and art (science and technology) is currently progressing very rapidly. In line with the progress of time in the field of science of technology and art, the world of education has always been progressing with their reforms made to curriculum, teaching model to teaching and learning tools or media learning [1].

In accordance with Permendikbud number 69 in 2013 about the high school curriculum-MA, one of the core competencies of learning in high school the core competencies 3 is understanding, applying, analyzing factual knowledge, conceptual, procedural, based on curiosity about science, technology, art, and cultural phenomena and events related to the causes and apply procedural knowledge in specific areas of study that suit their talents and interests to solve the problem. Therefore, the material on conceptual knowledge in the field of chemistry taught in SMA / MA must be thoroughly understood by the students.

Based on the questionnaire distributed in SMAN 1 Puri Mojokerto, 81% of students consider that chemistry is a difficult subject to understand. Students require in-depth knowledge to understand concepts in chemistry. Although classified as a attractive and relatively easy subject compared to other subject, are still many obstacles in the learning

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of Chemical Elements. Chemical elements have fairly wide range of subject and involve many calculations, more learned to the origin of the chemical, its properties and uses. The method used when studying chemical subject element in SMAN 1 Puri Mojokerto are lectures and presentations so that methods make students feel bored.

So far, the learning of chemistry at SMAN 1 Puri Mojokerto using media textbooks, worksheets, and a power point that 86% of children believe that learning media used less attractive so that lessons become monotonous and makes students become bored. The process of learning in the educational unit organized in an interactive, inspiring, fun, challenging, motivating the students to actively participate and provide enough space for innovation, creativity, and independence in accordance with their talents, interests, and physical and psychological development of learners. In this regard, the teachers are required to have knowledge about innovations. Learning. Innovation is intended to better teaching and learning activities and more attractive, so that the role of the teacher in the learning process is very important in implementing the teaching and learning activities. [2]

The amount of subject and the delivery of subject that glimpse for the pursuit of other subjects for the preparation of national examinations cause a reduction in learning time. In interviews with the chemistry teacher, students tend to not pay attention to the explanation of the teacher because the students feel themselves able to read the subject. XII grade chemistry teacher SMAN 1 Puri Mojokerto find it difficult to make learning interesting chemical element, knowing the demands of the curriculum in 2013 to make learning interesting by utilizing existing facilities.

Therefore, teachers are expected to be able to use as much as possible of cheap, efficient, and simple in achieving learning goals in the learning process, the media can be used are media audio, visual media, and audio-visual media. Audio-visual media have a greater ability than other instructional media for covering auditory and visual media. Instructional video media not only used by the teacher in the learning process, video media can also be used by students to repeat subject that has been given. Besides video media can also be used repeatedly and video media can be used on a long period of time in the learning process for the contents of the video media is still relevant with the existing subject [3]

The learning process is a communication process, delivering a message of introduction to the receiver. Message content or form of doctrine which was poured into symbols of communication, both verbal and nonverbal. [4] A total of 42% of students want activity in the laboratory so that the learning activities more attractive. Students' understanding of the teaching subject will be more effective if he had not only obtained the concept, but he was also able to find the concept by itself. Lab activities that can be done in a subject of chemical elements, namely on the nature of the common class of alkali and alkaline earth metals, but based on interviews with chemistry teacher SMAN 1 Puri Mojokerto small possibility could be done was done the lab due to limited materials in the laboratory make the students could not do practicum to deepen the concept of Chemical Elements in the subject. These barriers can be overcome by using a variety of learning resources, for various forms of learning solutions and manufacture better subject would push the final result is more optimal and qualified. One of the learning resources that can be used is the video, is to create a demonstration video on chemistry and use while learning.

The advantages of video that is able to provide a more realistic picture and be able to explain the process and skills. Video can display motion accelerated or slowed so more easily observed, to show the details of an object or process and make learning more attractive presentation. [5]

In accordance with the above description of the background, can be formulated research questions how the validity, effectiveness and practicality media video demonstration of chemistry that developed on the chemical elementsubject matter?

Based on the objective formulation of the problem above, the purpose to be achieved is to know the validity, effectiveness and practicality media video demonstration of chemistry that developed as a instructional media.

**METHOD**

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This type of this study is developmental research. The target of the research is media video demonstration of chemistry that developed, while for preminary field testing the media is 12 students of class XI-MIA SMAN 1 Puri Mojokerto. The procedure will be carried out research development is guided by the design of Research and Development (R & D) with modifications [6].

Research conducted only limited to preminary field testing. The following diagram research stages that have been adapted to the design of research and development:

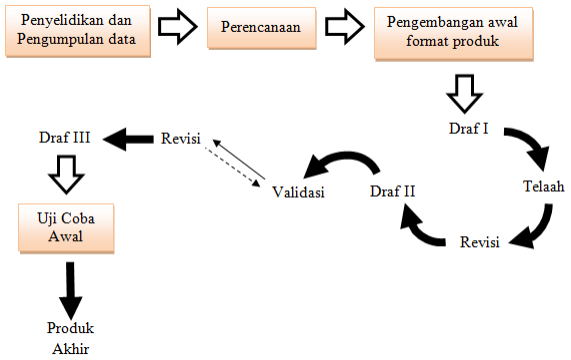


Figure 1. Modify the design of R & D

The study consists of four stages. Here the detail stages:

1. **Research and information collecting**

At this stage study of literature and field by field observations, questionnaires and interviews at school. This stages consists of the analysis of students, analysis of curriculum and learning indicators, and analysis of the school environment.

2. **Planning**

This stage is for planning the media video demonstration of chemistry that will be developed. To facilitate the m that contains a picture of the media video demonstration of chemistry will be developed.

3. **Developed primary form of product**

This stage consists of a review of the product, product revision, product validation and revision of the product to result a valid media. The instruments used in data collection in this stage of the review sheets and validation sheets. Review sheets filled by chemistry lecture and chemistry teacher in the form of criticism and suggestions for get a better media. Validation sheets also filled by chemistry lecture and chemistry teacher, then data obtained were analyzed quantitatively. Validation is done by 3 validator. The percentage of this validation result data obtained by the scale linkert in the following table:

**Table 1. Likert Scale**

| Assessment | Score |
|---|---|
| not good | 0 |
| less good | 1 |
| good enough | 2 |
| good | 3 |
| very good | 4 |

Eligibility percentage is calculated using the following formula:

$$P\ (\%) = \frac{\text{total score of collecting data result}}{\text{Criteria score}} \times 100\%$$

with description:
Score Criteria = highest score x number of questions x number of respondents

Media is valid if the respective criteria percentage ≥ 61%, then the media can be said to be valid [8].

**4. Preminary field testing**

The Preminary field testing is done at SMAN 1 Puri Mojokerto in class XI-MIA by the number of students is 12 people. In this stage, we got the data of practicality and effectiveness media video demonstration of chemistry.

a. Practicality

Practicality aspect in terms of the results of the students' responses. Data of student's responses analyzed with quantitative descriptive to provide an overview and presented this study of media video demonstration of chemistry that developed.

**Table 2. Guttman scale**

| Answer | Score |
|---|---|
| Yes | 1 |
| No | 0 |

Riduwan [7]

Eligibility percentage is calculated using the following formula:

$$P\ (\%) = \frac{\text{total score of collecting data result}}{\text{Criteria score}} \times 100\%$$

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with description:

Score Criteria = highest score x number of questions x number of respondents

Media is said to be practical if the respective criteria percentage ≥ 61%, then the media can be said to be practical [7].

b. Effectiveness

Aspects of effectiveness in terms of students learning outcomes. Students had individually completed learning if they reached predicate B- or ≥2.67 from posttest results obtained from the chemical subject elements. From pretest and posttest results will be known whether an increase or decrease in student learning outcomes. Data values obtained from the pretest and posttest used to calculate the gain (N-gain). Here is the formula used to calculate the N-gain:

$$\text{N-gain} = \frac{S_{post} - S_{pre}}{S_{maks} - S_{pre}}$$

With description:

$S_{post}$ : posttest score

$S_{pre}$ : pretest score

$S_{maks}$ : maximum score

Then, criteria for the increase in N-gain shown in the following table:

**Table 3 Categories of N-gain**

| N-gain score | Category |
|---|---|
| g > 0,70 | High |
| 0,30 < g ≤ 0,70 | Moderate |
| g ≤ 0,30 | Low |

Hake [8]

## RESULTS AND DISCUSSION

In this study would be described the result of study obtained and its discussion during the development of media video demonstration of chemistry. The data obtained are described in accordance with the stages of the design of the study:

**1. Research and information collecting**

This stages aims to obtained the analysis of students, analysis of curriculum and learning indicators, and analysis of the school environment. This stage is carried out literature studies and field studies with observations in SMAN 1 Puri Mojokerto. Observations show 81% of students found chemistry is difficult lessons for the delivery of teacher unattractive and media used only oriented textbooks and power point. The results of the observation, generally 90% of students bring laptops to school to do assighment and make a power point. While the learning process is implemented in schools still use the lecture method, in other words, the teacher is not utilizing existing facilities. Based on the results of the questionnaire said that 90% of students agreed the development of computer-based learning media one of which is a media video demonstration of chemistry. At the stage of formal operations [9], the students liked the learning interesting and involving students directly, so selection of instructional media deemed appropriate.

The curriculum used SMAN 1 Puri Mojokerto is curriculum 2013. So based on the curriculum syllabus 2013 obtained by analysis of curriculum XII-MIA class curriculum that is at KD 3.6 containing analyzes of abundance, the tendency of physical properties and chemical properties, benefits, impacts, the process of making the elements of main group (noble gases, halogens, alkali and alkaline earth metals, period 3) and transition elements (period 4) and compounds in everyday life.

The school environtment of SMAN 1 Puri Mojokerto has complete facilities. There are wifii school facilities, each classroom is equipped with an LCD and there is a computer lab containing 40 computers in good condition. With media video demonstration of chemistry is expected to support the learning process.

**2. Planning**

The results of the Research and information collecting then followed up with product planning.

a. Determining the Media Program Outline

The first activity undertaken on the media planning stage is to determine the outline of the media program to be created, includes media titles to be developed, intended use of the media, the target or the media, the subject becomes developed content in the media, and

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the media format. Determining the outline of the media program aims to facilitate and restrict the content / media learning content developed.

b. Make a Storyboard

The next step in making the initial product design is to create a storyboard, which describe the content of each display in a video demonstration of chemical media.

c. Collecting materials

The materials used in the manufacture of this media covering subject, pictures, video and sound support. These subjects must be prepared in advance with the aim to facilitate the process of making the initial product in this study is media based theMacromedia Flash. The materials required obtained by downloaded or from books.

d. Programming

Storyboard and materials that have been collected is processed in a program such that it becomes an integral part of flash media in exe format. The results of the preliminary design of media video demonstration of cheminstry is called as draft I.

**3. Develop primary form of product**

Based on the planning that has been made, then the next stage is develop primary form of product. Results from Develop primary form of product is called a draft f I. In addition to the draft media, also developed instruments to be used for review, the student's responses sheets, learning outcomes test (pretest and posttest), and lesson plan.

Media made with flash and produce software applications with format.exe. Application of this media can be played on any computer or laptop device however it does not have Macromedia Flash applications. Here scene the opening pages of the first draft media video demonstraton of chemistry produced:


**Figure 1. The welcome page draft media**

The research instrument was made that student's responses sheets and students learning outcomes (pretest and posttest). The results of the student's responses sheet are used to measure the feasibility of practicality media components. students learning outcomes test (pretest and posttest) was used to measure the feasibility of the effectiveness of media components.

After the draft I media video deonstration of chemistry created, then its reeviewed by three chemistry lecture and chemistry teacher for advice and feedback on the media developed and instrument. This study aimed to obtain advice and input for the perfection and improvement of media. From these suggestions, next we done a draft revision and its called draft II.

Draft II revision of the study then validated to obtain valid and worthy media. Validation is done by three validator consisting of chemistry lecturers and chemistry teacher. Assessment is done by selecting one of five options that accompany every statement. Media is feasible if each of its components get score with a large percentage of more than 61% so that used in the learning process [7].

The percentage of the overall assessment of the content validity was obtained by 95%, and 93.52% for construct validity so that it can be categorized in the category of very valid.. Utilization of a decent media used in the learning process should be planned and systematic in accordance with the purpose of learning so that their media is helping students to understand a concept. [10]

**4. Preminary field testing**

The Preminary field testing is done at SMAN 1 Puri Mojokerto in class XI-MIA by the number of students is 12 people. In the Preminary field testing data showed the effectiveness and practicality of the media. Data obtained from the effectiveness from student learning outcomes test (pretest and posttest) while the practicality of data obtained from the results of the students' responses sheet.

a. Effectiveness

The effectiveness media video demonstration of chemistry is obtained from data on student

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learning outcomes test. Pretest given before Preminary field testing took place while the posttest given after the Preminary field testing is completed. Students completed the learning said if the average score of 2.68 or predicate ≥ B-.

**Table 3. Results of student learning**

| | Complete | Uncomplete |
|---|---|---|
| ***Pre test*** | 4 | 8 |
| ***Posttest*** | 12 | 0 |

From the results of the pretest, as many as eight students have not reached the compleness and 4 students achieve completeness learning. After the media video demonstration and then do posttest, all students achieve compleness learning and is seen improving student learning outcomes (N-gain). N-gain obtained as much as 75% of students included in the category of medium to increase gain value ≤ 0.3 g <0.7, and 25% of students include the category of high increase in the value of g≥ 0.7. Based on the result of N-gain media video demonstration of chemistry that developed expressed effectively used as a instructional media in chemistry subject elements.

b. Practicality

Practicality media video demonstration of chemical derived from data from students' responses sheet and students responses sheet provided to students and used to determine their response to an understanding about the practicality of the subject, the attractiveness of the presentation, as well as using a language that is easily understood by students in chemistry demonstration video media.

Overall, based on data obtained from the students responses sheet, the percentage of each aspect obtained by percentage of ≥ 61%. The average percentage of all aspects assessed in the amount of 93.16% with a very practical criteria. So that the media video demonstration of chemistry on chemical subject element is expressed practically used as a instruktional media on the chemical subject elements. Plomp and Nieveen [11] states that the practicality aspect can be seen in terms of users, namely whether in fact shows the media that was developed can be applied by teachers and students

## CLOSURE

### Conclution

Based on the analysis results, it can be concluded that the media video demonstration of chemistry for class XII students in the chemical subject elements feasible for use as instrutional media with the following conclusions:

1. Media video demonstration of chemistry on the chemical elements subject that have been developed otherwise valid use as a instructional media in terms of the criteria in the content validation (95%) and construct validation (93,52%).
2. Media video demonstration of chemistry on the chemical elements subjects that have been developed was effective in terms of student learning outcomes is an increase of 75% of students in the moderate category and 25% of students in the high category.
3. Media video demonstration of chemistry on the chemical elements subject that have been developed practically expressed in terms of the results of the students' responses sheets(93,16%).

### Suggestion

Developing media video demonstration of chemistry for class XII students in the chemical element subject in this study researchers only on the initial testing phase, to get more information on media videos demonstration of chemistry on chemical elements subject necessary to the implementation of the actual class.

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